TECHNOLOGICAL CHANGE at

the co-operators

Addressing the Human Element

By Malcolm Chadwick
Edited by
Graham Parsons

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TECHNOLOGICAL CHANGE AT THE CO-OPERATORS LIFE INSURANCE COMPANY

Technological Change at the Co-Operators Life Insurance Company:

Addressing the Human Element

Malcolm Chadwick

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PREFACE

Technological change has been a recurring theme in the development and evolution of the Canadian prairie. The advent of mechanized farming, the migrations from the land and the new technologies of mineral extraction have often held personal and direct significance for the lives of prairie residents.

In the 1980s the winds of technological change are blowing hard throughout the industrialized world and into the prairies. Advances in the new technologies of satellite communications, information management, micro-chip computerization and genetic engineering at times seem far removed from the prairie economy and society. Yet the new approaches are already seeing application in some sectors and regions. The Human Resource Advisory Group of the Canadian Plains Research Center has been concerned over the implications of these newly emerging trends for the prairies and its people.

Two workshops held in January and September 1984 identified a range of issues and options that focussed on the effects of technological change on the region's labour force. The following report is one of a series of research reports that have investigated specific issues and options identified in the workshops. They provide clear evidence that technology is having its effect on prairie jobs and that it will hold increasing significance in the coming years for the policies and practices of industry, labour, government and the educational system.

The following study by Malcolm Chadwick reviews the process of technological development within the offices of a large prairie insurance company, identifying the effects upon the organization, productivity, employees and management. The findings do identify some points of friction in the process but also recognize the clear benefits for both employees and management that can be available from the new office technologies.

The current research study and the related workshop proceedings are released* in an effort to encourage increased discussion, study and resolution of the role of technology in the continued evolution and development of the prairie economy and society.

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This paper is in partial fulfillment of a Master of Arts Degree in Applied Social Psychology at the University of Saskatchewan. Inquiries should be directed to R. Malcolm Chadwick, c/o R.B. Cormier and Associates, Suite 514, 10053 - 111th Street, Edmonton, Alberta, T5K 1K4. Requests for copies and inquiries regarding publication rights should be directed to the Canadian Plains Research Center, University of Regina, Regina, Saskatchewan, S4S 0A2 or to Mr. Bill Dinu, Director of Research and Planning, Co-operators Life Insurance Company, 1920 College Avenue, Regina, Saskatchewan, S4P 1C4.

TECHNOLOGICAL CHANGE AT THE CO-OPERATORS LIFE INSURANCE COMPANY: ADDRESSING THE HUMAN ELEMENT

INTRODUCTION

The current era of technological advancement, highlighted by the advent of microelectronics, informatics, advanced automated techniques and robotics, portends revolutionary changes in most facets of our society (Science Council of Canada, 1982). Many experts readily agree that technological change has brought, and will continue to bring, massive change to the world economy in general (Hawken, 1983; Naisbitt, 1982) and the workplace in particular (Long, 1984; Smith, 1983; Kasurak, Tan, and Wolchuk, 1982; Science Council of Canada, 1982).

Through the use of advanced technology we have shifted from a mass, industrial and manufacturing-based economy of the 1950s to the current services and information-based economy of the 1980s and beyond (Hawken, 1983; Smith, 1983; Naisbitt, 1982). In Canada for example, the service industry in 1981 accounted for 60% of the total labour force as compared to only 31.7% in 1946. This indicates a massive shift in occupational and skill needs in the span of just thirty-five years (Belanger, 1983) as well as the increasing dominance of the service sector in our economy. This transition is also evidenced by the fact that ". . . the office has overtaken the factory as the most prevalent workplace" (Smith, 1983, p.3).

Consistent with the current era of economic transition brought about by technological innovation and concerns for increasing office productivity is the realization that technology will revolutionize work in the office. Long (1984) points out, however, that few experts agree on the exact effects technological change will have on work aside from increased productivity. Most envisage differing scenarios ranging from gravely pessimistic to wildly idealistic depending on their focus.

The negative interpretation of technological change, if taken to its extreme, suggests that in addition to massive unemployment (Labour Canada, 1982) and severe shifts in occupational and skill needs, the office of the future will be staffed by human automatons, endlessly performing monotonous, repetitive tasks controlled by machines. Consequently, there will be little hope for personal growth or advancement — a grotesque extension of Orwellian and Tayloristic dimensions (Katz and Kahn, 1978, pp. 9, 10, 261-63 briefly describe the basic principles of scientific management theory proposed by Taylor in the early 1920s. These principles are still prevalent in the design of most jobs and tasks today. See Taylor, 1923 for the original sources).

Conversely, the positive alternative reveals an office in which tedious and repetitive tasks are essentially eliminated. Employees at all levels exercise opportunities to fully use their skills, knowledge, and judgement, to be creative and generally, to have their work and working lives enriched in conjunction with higher productivity.

Long (1984) maintains that managerial values and beliefs, not the technology itself, appear to be the prime determinant in dictating which outcome will prevail. Given the increasing recognition of the value of simultaneously maximizing our human as well as technological resources (Chadwick and Clark, 1983), some managers are becoming more aware of the options and alternatives to a strictly mechanistic approach to applying new technologies to the workplace (Van Beinum, 1981). Unfortunately, many managers still possess the classical values and beliefs characteristic of the mechanical approach in an industrial society which traditionally ignores the human element (Long, 1984).

It comes as no surprise that the impact of technological innovation on work, work design, and the working person has become a central issue in office automation (Smith, 1983). Within the last ten years, research in this area has exploded. It addresses issues ranging from quality of working life (Long, 1984) and management of the electronic office (Kasurak, Tan, and Wolchuk, 1982), to reproductive hazards and work stress (Chenier, 1982) and concerns about job loss (Menzies, 1981).

Bowditch and Buono (1982) have noted that work-related attitudes of employees have recently received increasing managerial attention. With inconclusive and often contradictory findings about the relationships between job satisfaction and productivity and other organizational variables (Porter and Steers, 1973), the managerial and academic focus is again shifting towards worker attitudes (Bowditch and Buono, 1982).

Research (Smith, 1983; Bowditch and Buono, 1982; Thompson, 1981) has identified a variety of issues that employees, managers, and technological change experts perceive as critical or important to address when implementing new technologies or systems. Bowditch and Buono (1982, p. 25) stress that it has become much more important to address employee attitudes regarding quality of working life issues than in the past and that it is vital to monitor employee opinions and attitudes on an ongoing basis.

Long contends (1984) that managerial values and beliefs are the determining factor on how positively or negatively technology will alter work designs and employee attitudes. In this context it is important to consider how management can recognize and address the human element when technological changes are pending. Otherwise, organizations and the people that contribute

to their success are not likely to reap nor maximize the fullest possible benefits of that change.

The purpose of the proposed study is to identify the current and projected effects of technological change on shifting occupational and skill needs within the Co-operators Life Insurance Company. In addition, employee attitudes and concerns will be examined in relation to technological change.

Before proceeding, some words of caution are in order. Many factors such as business growth, diffuse company boundaries, a history of organizational mergers, amalgamations, and restructurings, a dearth of internal documentation about technological change, and the lack of rigorous experimental procedures, necessarily complicates making strict cause and effect statements about the impact of technological change. Consequently, the reader is urged to view the current study and its findings as a descriptive account of technological change in a specific setting. Hopefully, this can generate a better understanding of technological change and its effects across a broader spectrum of our society.

The remainder of this book will present, in case study format, the brief history of Co-operators Life Insurance Company, its organizational climate, and how technology has influenced shifts in occupational and skill needs on a department by department basis. The issues and findings presented in the case study will be followed by a discussion in which future trends and projections at Co-operators Life are identified and linked to general societal concerns regarding technological change.

METHODOLOGY

A case study and survey-based approach was used. A review of internal documentation (e.g., minutes, memos, internal reports, manuals, etc.), structured and unstructured interviews, observations, and a survey-questionnaire administered to all employees, provided source data. The author was on-site approximately four days per week for a period of eleven weeks to facilitate the data gathering process.

Internal documentation, observations, and unstructured interviews were used to validate and confirm data from other sources and to provide the researcher with additional information relevant to the purpose and context of the study. A detailed description of the method employed is outlined in Appendix A.

THE CASE STUDY

Background

The Co-operators Group Limited (Co-op Group) is a holding company responsible for the management of six wholly-owned subsidiaries: Co-operators Life Insurance Company; Co-operators

General Insurance Company; Co-operators Data Services Limited; Co-operators Development Corporation Limited; Federated Agencies and CIA Agency; and CUDATA Services (Ontario) Limited. The Co-op Group provides general management, treasorial, and secretarial services for all subsidiaries. The member-owners of The Co-op Group are thirty-seven Canadian co-operative and credit union centrals, farm and other co-operatively oriented organizations (see Figure 1). It has developed since 1945 with strong ties to the Saskatchewan Co-operative movement (see Table 1).

The Co-op Group maintains over 250 service offices across Canada with regional offices located in: Vancouver (British Columbia Region); Calgary (Alberta Region); Winnipeg (Manitoba and Saskatchewan Region); Ottawa (North Eastern Ontario Region); Toronto (Central Ontario Region); London (Western Ontario Region); Moncton (New Brunswick and Prince Edward Island Region); and Halifax (Nova Scotia and Newfoundland Region). Division offices of The Co-op Group are located in: Calgary (Western Division); Guelph (Ontario Division); and Moncton (Atlantic Division). Corporate offices are maintained in: Guelph and Toronto, Ontario; and Regina, Saskatchewan.

The stated mission of The Co-op Group is twofold: to be a national co-operative providing quality insurance, financial, and related services; and to be controlled by co-operative central organizations and by farm and other co-operatively oriented organizations in Canada. Total staff employed by The Co-op Group as of 15 July 1984 exceeded 3,750 persons.

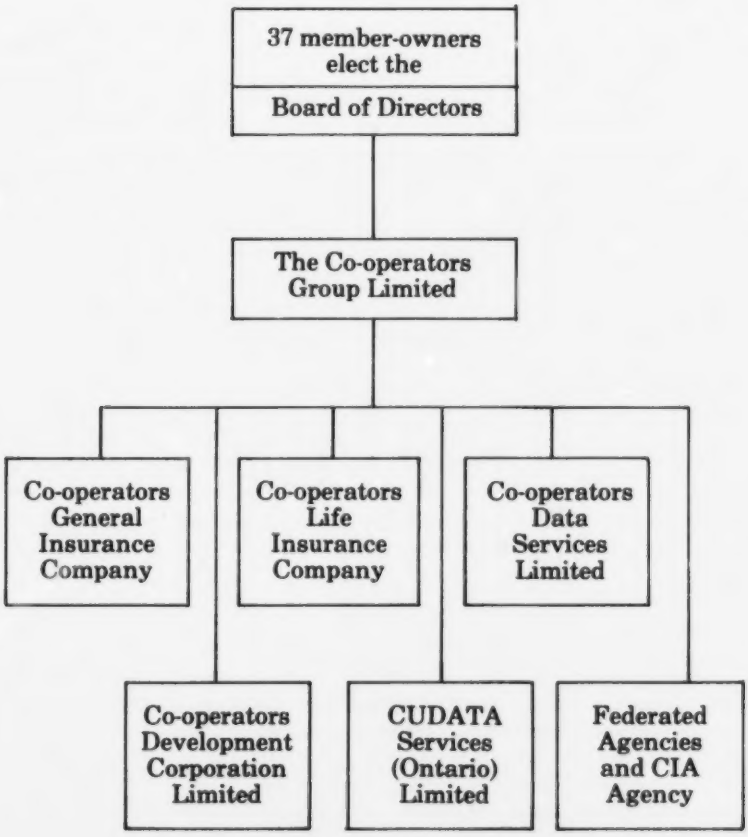
Insurance services offered by The Co-op Group are provided by the Co-operators Life Insurance Company and the Co-operators General Insurance Company and cover a diverse range of individual, group, business, and credit union insurance products. The Co-operators Life Insurance Company (Co-op Life) develops and underwrites individual, group, and credit union life insurance policies whereas the Co-operators General Insurance Company develops and underwrites all other insurance products (e.g., fire, auto, liability, etc.) as well as providing the sales and distribution network for all Co-op Group insurance products.

Employees of Co-op Life generally fall into one of four 'product' areas: individual life insurance representing about 48% of the employee population; group life insurance with about 22% of the population; credit union insurance with about 13% of the employees; and an 'other' category including research and planning, actuarial, and accounting personnel with about 17% of the population. As well, the employee group can be classified in terms of an internal grading/compensation system: clerical and processing personnel representing about 55% of the employee population; technical and supervisory personnel with roughly 30% of the

Table 1
Chronological Development of the Co-operators Group

Year	Development
1945	Co-operative Life Insurance Company formed (Saskatchewan)
1946	Co-operators Guarantee and Fidelity Association formed (Ontario)
1947	Life and general insurance department formed by Maritime Co-op Services (Atlantic Region)
	Co-operative Life Insurance Co. obtains federal charter
1950	Co-operators Fidelity and Guarantee Association becomes Co-operators Insurance Association (CIA)
1952	Co-operative Fire and Casualty Company federally incorporated as a companion company to Co-operative Life Insurance Co.
1958	Maritime Co-op Services withdraws from life insurance field and Co-operative Life Insurance Co. assumes life insurance services in Atlantic region
1959	Co-operators Life Insurance Association (CIA Life) formed as companion company to CIA
1963	Co-operative Life Insurance Co. and Co-operative Fire and Casualty Co. placed under the control of a holding company; co-operative Insurance Services (CIS)
	Maritime Co-op Services sells general insurance business in Atlantic region to CIS
	CIA and CIA Life placed under the control of Co-operators Insurance Associations of Guelph (CIAG)
1975	Co-operative Insurance Management Group formed as a holding company to control all CIS and CIAG companies
1978	Co-operative Insurance Management Group registered under the Canada Cooperative Associations Act, name changed to The Co-operators Group Limited (Co-op Group)
1982	CIA Life and Co-operative Life Insurance Co. merge to form Co-operators Life Insurance Company (Co-op Life)
1983	Co-op Group re-organized into six companies (see Figure 1)

Figure 1
Organizational Structure of the Co-operators Group


37 member-owners elect the
Board of Directors
The Co-operators Group Limited
Co-operators General Insurance Company
Co-operators Life Insurance Company
Co-operators Data Services Limited
Co-operators Development Corporation Limited
CUDATA Services (Ontario) Limited
Federated Agencies and CIA Agency

employees; and senior managers and directors representing approximately 3% of the population. Over 78% of the employees at Co-op Life are female, the majority of whom occupy the clerical/processing and technical/supervisory positions.

Since the inception of the Co-operative Life Insurance Company in 1945, there has been a continuous trend of increasing business growth. For example, in 1960 CIA Life and the Co-operative Life Insurance Co. had over 23,000 individual and group life policies in effect insuring over 140,000 persons. By 1983, Co-op Life had

roughly 115,000 individual and group life policies in effect (not including over 100,000 small, 'add-on' policies) insuring almost two million persons. This represents significant and real business growth in excess of 500% in less than 25 years. The growth of Co-op Life appears representative, in a microcosmic sense, of the general growth trend in the service sector in Canada within the last few decades.

The Co-op Group is currently the largest Canadian-owned, multi-line insurer in Canada and the leading insurer of credit unions, co-operatives and their members. With assets of approximately $900 million, The Co-op Group remains the second largest non-government general insurer in Canada, with Co-op Life ranking nineteenth in life premiums in effect in Canada.

The amalgamation of Co-operative Life Insurance Co. and CIA Life into one company (Co-op Life) under the direction of The Co-op Group, allowed The Co-op Group to provide uninterrupted life insurance services across Canada to its customers. The Regina office (Co-op Life headquarters) continues to develop and underwrite all life insurance products across Canada with individual life insurance administration for Ontario managed in the Guelph location. Co-op Life currently employs about 190 people (all non-union) with approximately 45 and 145 persons at the Guelph and Regina locations respectively. Figure 2 illustrates the current organization structure of Co-op Life.

Consistent with an understanding of the development and implementation of advanced technology at Co-op Life is a recognition of the major role that Co-operators Data Services Ltd. (Co-op Data) has played. In 1961, the Co-operative Fire and Casualty Co. began operating a data department which was controlled by the Treasury department of CIS from 1963 until 1975. In 1975, the data department became a division of the Co-operative Insurance Management Group and in 1983 it was incorporated as a separate company within The Co-op Group.

The function of the data department (which later became Co-op Data) was to take advantage of new technologies as a means of improving the effectiveness and efficiency of business operations within the Co-operative Fire and Casualty Co. and the Co-operative Life Insurance Company. Over time, the mandate of Co-op Data expanded to include CIS, all companies within The Co-op Group, and other external, co-operatively oriented organizations. Co-op Data's current focus emphasizes consulting and the marketing of advanced informatics to any interested organization.

Co-op Data also operates as a computer processing centre and clearing house for new, technologically-advanced equipment, software, and systems designs as required by any of The Co-op Group companies. For example, when systems needs are recog-

nized within Co-op Life, consultations with appropriate Co-op Data personnel commence and the feasibility of certain approaches are examined. These approaches may include the purchase of necessary new equipment and the design of new software systems by Co-op Data which Co-op Life in essence leases from Co-op Data. Conversely, an external vendor for a system might be identified as the most viable option. Whatever approach is finalized, depends of course on standard business practice (e.g., cost-effectiveness, available expertise, time constraints, etc.).

In effect, Co-op Life and the other Co-op Group companies purchase the expertise and hardware from Co-op Data much the same as would be done from an external computer services vendor. An obvious advantage of the current 'in-house' arrangement as compared to extensive reliance on many external vendors is the proximity and availability of expertise not to mention the very close working relationships and familiarity established over the years.

Co-op Data retains the responsibility for operating and maintaining computer equipment as well as a large part of the data input function (e.g., key punch operators). Since the scope of the current study is limited to the impacts of technological change on shifts in occupation and skill needs within Co-op Life, the effects of technological change beyond the immediate boundaries of Co-op Life may not be fully identified.

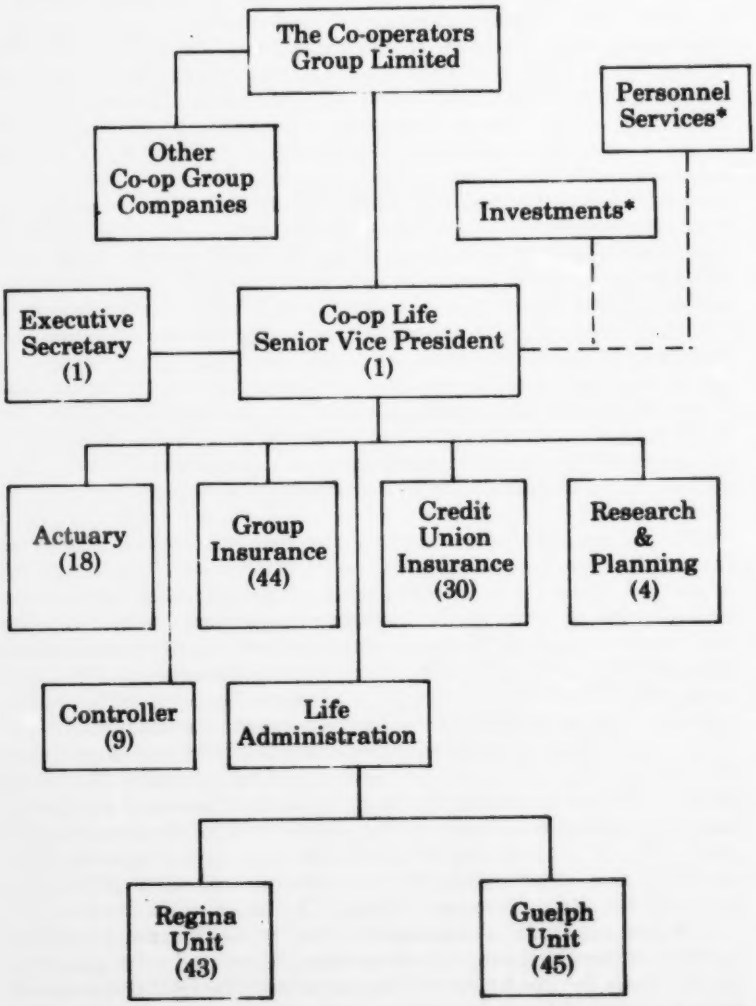
New Technologies

For purposes of the current study, technological change was defined as the implementation of any advanced piece of equipment or system which is designed to improve the effectiveness and/or efficiency of business operations. Items or products such as computers, high speed printers or copiers, telecommunication devices (excluding the standard telephone), software systems and programmes, etc., would qualify as being technologically advanced and as being principal components of technological change.

In the case of Co-op Life, it is appropriate to break advanced technology down into two, simplified categories; hardware and software or systems. The hardware is simply the equipment (e.g., a computer or computer terminal, a word processing station, a printer, etc.) used to perform a function. Software or systems on the other hand can be viewed as a set of instructions, procedures, or commands which controls the functions performed by the hardware. The introduction of major new office technologies at Co-op Life is discussed below and in Appendix B on a departmental basis.

Figure 2

Organizational Structure of the
Co-operators Life Insurance Company



* indicates services provided to Co-op Life by Co-op Group

() indicates approximate number of employees in that area

Hardware Development

The introduction of advanced technological hardware can be traced to 1964 when, following the merger of the Co-operators Fire and Casualty Co. and the Co-operators Life Insurance Company into Co-operators Insurance Services (CIS), the chief executive officer began to push strenuously for the adoption of advanced technological equipment in appropriate areas throughout the company. In 1964, the CIS data department purchased its first mainframe computer (i.e. a central processing unit or CPU), an IBM 1401 with a capacity of four kilobytes (i.e. 4000 bytes or 32,000 bits of information) of Random Access Memory (RAM).

Limited use was made of this computer. Its main application was in automobile insurance where information such as names and addresses could be stored and retrieved as needed. The procedure required that information be first manually coded onto coding sheets then mechanically key-punched onto data entry cards by data department personnel. A set of commands which constituted a computer programme was also key-punched and the computer could then process the card deck (including both command and data cards) and store the information internally for future retrieval. CIS gradually moved to storing information on tapes and discs over a period of years which allowed for greater storage capacity and faster retrieval of information. For several years, all information storage and retrieval was on a batch or periodic basis.

It is interesting to note that initially, technological change was responsible for increasing staff at CIS as extra staff were required to perform the data entry function; manually onto coding sheets, and key-punch onto cards. Fifteen people were required in the data processing department to work on in-house systems designs and applications. Up to 1974, five to ten of these people operated and maintained the existing hardware. Since that time, the number of personnel at Co-op Data has risen substantially.

In 1967, CIS purchased a more powerful IBM 360 mainframe computer with an operating capacity of 64 kilobytes (K) RAM. This computer is similar to the capacity of many commercial home computers available on the market today with the exception that today's models are much faster and more reliable. This system was used primarily for data storage and retrieval and still required the step of key-punching information onto cards.

The first application of computers in the Life Company occurred in 1967 when financial reserves were calculated on a policy by policy basis for the Actuarial Department. The IBM 360 was also able to provide basic summary statistics on other high volume insurance systems for CIS management. By the end of 1967, data was being stored onto floppy discs which again increased storage capacity and the speed of access to stored information.

In 1970 the IBM 360 was upgraded to 128 K capacity and two computer terminals were purchased and placed in the Data Services area. The terminals allowed operators to enter transactions through the terminal rather than code them on cards. However, computer work was still batch processed, usually on weekends and evenings. The advent of the terminal did allow for immediate access to information already stored and represented the first on-line application for computer technology at CIS. The Life Company used this system to batch process large volume premium payments and for data entry on new and existing life insurance policies.

In the latter part of 1971, a remote job entry (RJE) printer was installed in the Moncton office of the Life Company which allowed for communication from the Regina to Moncton office as required. This equipment marked the first combined computer and communications application at CIS, commonly referred to as informatics, and signalled the start of a process which will likely see all Co-op Group offices (over 250 nationally) linked together through a common telecommunications and computer network within the next few years.

In 1972, CIS bought an IBM 370-145 mainframe computer with 384 K RAM of operating capacity which allowed the Life Company to further expand the breadth and depth of its systems. By 1974, several computer terminals had been placed within the Life Company itself which allowed for much more extensive on-line input of data even though information was still batch processed. At this point, the hardware was still limited to displaying stored data (on screen), having data manually input through the terminal, electronic filing of information, and access to limited kinds of on-line information such as names and addresses.

By 1975 CIS had purchased an additional IBM 370-145 with 1024 K of operating capacity and upgraded their existing system to 512 K. One computer was used for terminal input and retrieval and data access while the other computer was used for programming and running batch systems. Also in 1975, user representatives (user reps) were hired at Co-op Life to act as internal systems consultants and to co-ordinate and liaise with systems users and vendors (e.g., with analysts from Data Services).

In 1979, CIS purchased two IBM 3033s with an operating capacity of 6000 K each for a total capacity of 12,000 K. This hardware coincided with the development of systems or software packages which allowed for realtime (i.e., on-line and immediate data processing) applications.

The Co-operators Group currently has four IBM 3083s, two of which have a capacity of 24,000 K each (located in Regina) and two in Meadowvale, Ontario which have a capacity of 16,000 K each for a combined working capacity of 80,000 K. Internal sys-

tems designers project that by 1990 The Co-op Group will have a combined computer working capacity of 175,000 to 250,000 K with computer terminals in all offices and one terminal available for every two Co-op Life employees. Aside from research applications, internal systems consultants suggest that The Co-op Group is close to the leading edge in terms of implementing new technologies and is a leader in the Canadian insurance industry in advanced technological applications.

It is evident that over the last fifteen to twenty years, Co-op Life has accessed, through Co-op Data, larger and more powerful computers. All indications suggest that this trend will continue in the foreseeable future (see Table 2 for a chronology of computer advances).

In terms of advanced hardware within Co-op Life itself, there are currently about fifty computer terminals which are tied into the CPUs for a variety of purposes. This represents approximately one terminal for every four Co-op Life employees. In addition, Co-op Life has access to four printers and three personal computers, one of which is linked to a CPU. As well as access to high-speed copiers, senior managers use a video display phone system which allows for teleconferencing, filing, and the transfer of written information between display phone users through the use of an attached terminal keyboard.

Word Processing

Prior to 1979, essentially all word processing or typing was accomplished through the use of first manual and then electric typewriters. The stenographic function was highly de-centralized throughout the organization. The one minor exception was the introduction in 1970 of a small number of IBM Magcard typewriters which allowed for information to be stored on and subsequently retrieved from cards or magnetic tape. The Magcard system was limited in scope and was used primarily for materials of large volume having a similar type of format such as specialized manuals.

In 1979, The Co-op Group initiated a company-wide analysis regarding word processing needs. A search committee was formed to identify available word processing systems consistent with the company's needs.

In the spring of 1981, an automated word processing (WP) system, consisting of five work stations and three letter-quality printers, was purchased by the Regina location of The Co-op Group. Each working station (a one-piece Video Display Terminal and terminal keyboard) initially had a working capacity of 8 K with the CPU having a storage capacity of 26 K. The WP CPU, in addition to storage capabilities, also provided a central control function for the work stations.

Table 2

Chronology of Computer Advances at Co-op Data

Date	System	Capacity
1964	IBM 1401	4 K
1967	IBM 360	64 K
1970	IBM 360 (upgrade)	128 K
1972	IBM 370-145	384 K
1974	Computer Terminals introduced	
1975	IBM 370-145 (upgrade) IBM 370-145	512 K 1024 K
1979	IBM 3033 (x2 @ 6,000 K each)	12,000 K
1984*	IBM 3083 (x2 @ 24,000 K each) IBM 3083 (x2 @ 16,000 K each)	48,000 K 32,000 K
1990*	(projected) ?	175,000 to 250,000 K

* includes the Meadowvale Data Centre

Since 1981, the WP system has gone through several revisions and upgrades which has facilitated a substantial increase in WP capabilities. The current system at the Regina location has twelve work stations and five letter-quality printers dispersed throughout the building and used by several WP operators.

In 1982, the WP system was linked to one of the CPUs at Co-op Data which in turn is linked to a very high-speed laser printer which allows for large volume printings (e.g., letters to policy holders) on a batch basis. Although the WP system is used for essentially all typing, old-style electric typewriters are still used for the odd application (e.g., a 'quick' letter or memo).

When the WP system was originally introduced, there was a tendency towards centralization of its function. A WP system was centred in the Regina building where all training and WP was performed. Recently, the WP function has been de-centralized such that work stations and printers are situated in areas of Co-op Life that have demonstrated significant WP needs. The WP system remains primarily as a resource centre for training and consultation.

In terms of shifts in occupational needs, the automation of the typing function has had little noticeable impact with the exception of two WP training and consulting positions, both of which are external to Co-op Life. Although the WP system did improve productivity, there has been no elimination of secretarial functions at Co-op Life mainly through a re-distribution of duties. At most, WP operators will spend three to four hours a day on the work stations in addition to other administrative duties. In essence, implementation of the WP system has allowed for some job re-design through a re-distribution of duties. In most instances, this has created an increase in job variety and a decrease in repetitive tasks.

Regarding shifts in skill needs, WP operators have had to acquire the requisite skills associated with operation of the WP system. Assuming that operators possess keyboard typing skills, it requires less than two weeks of training to become proficient at word processing. This skill shift does not appear to be of a major nature, requiring little expenditure and affecting few people at Co-op Life.

Mail and Memo Systems

There are two automated mail and memo systems in operation at Co-op Life, both of which can be accessed through the display phones and computer terminals. One system which is used primarily through the computer terminals is basically an electronic bulletin board which allows any employee to input or retrieve messages via a terminal. This system is also used for informal networking among employees.

The second system has more restricted use and functions primarily as a private message and memo board and filing system between users. This system has all but eliminated the paper memo at the senior managerial level in the organization. There is no indication of shifts in occupational needs as a result of the implementation of these systems; however, there has been a shift towards an increased need for improved typing, systems knowledge, and terminal keyboard skills, especially at the managerial level.

TECHNOLOGICAL CHANGE AND EMPLOYEE ATTITUDES

Consistent with the focus of the current study, a questionnaire-survey regarding employee attitudes about technological change and other concerns was administered to all Co-op Life employees and to members of the investment and personnel services departments (see Appendix C). In addition, twenty structured interviews and many more informal interviews were conducted with all levels of employees in an effort to gauge general perceptions about technological change. This section will identify general employee responses and attitudes about technological change

that are relevant to the content of the current study.

Of the 205 surveys distributed, 199 (97%) were returned and 186 were answered for a response rate of 91%. The return and response rates were considered to be exceptionally high and support the contention that employee interest in the content and outcome of the study was substantial.

The "average" employee was identified as female, 26 to 30 years of age with about five years of full-time service, currently at the Grade 3 or 4 level, and earning between $15,000 and $20,000 per year. This "average" employee has completed high school and at least some college, university or professionally accredited courses, and spends about 25% of her time actually using advanced technology in her job.

Approximately 75% of the employees felt that technological change had affected their jobs somewhat to a great deal within the last five years. Generally, the more years of service an employee had with Co-op Life (or any of the other Co-op Group companies) and the greater amount of time employees used advanced technology in their jobs, the greater the extent they perceived technology had affected their jobs in the past. Over 87% felt that technological change would affect their jobs somewhat to a great deal in the next few years. These findings indicate that employees generally saw technological change as having had a relatively large impact on their jobs in the past and that it will have even more of an impact in the future.

About two-thirds of the employees felt somewhat to a great deal concerned about the impacts of technological change whereas well over 90% viewed technological change as at least somewhat positive. Only 25% responded that technological change was somewhat to a great deal negative and less than 18% viewed technological change as somewhat to a great deal threatening. These findings suggest that Co-op Life employees generally viewed technological change as positive and not very threatening but *that they were concerned about possible impacts of technological change.*

Employees identified the following concerns in order of importance, as being important or critical regarding technological change: job or employment loss; loss of job variety; boredom; health factors, including physical and mental stress; the loss of human contact; and the loss of job autonomy. Conversely, employees identified the following benefits, in order of importance, as important regarding technological change: increases in organizational effectiveness and efficiency; opportunities for employees to learn new skills; less menial, boring, repetitive, and tedious tasks and jobs; and greater job flexibility. The preceding issues identified were consistent with the issues mentioned during many interviews and indicate that employees perceived a range of positive

and negative potentialities arising out of technological change.

Over 95% of employees responded that technological change was somewhat to a great deal accepted as normal at Co-op Life and just under 90% felt somewhat to a great deal comfortable about technological change in general. These and previous findings are consistent with Co-op Life's twenty year history of technological change and support the view that technological change is an established and accepted norm within the organizational environment at Co-op Life.

Over 95% of the respondents indicated that they had somewhat to a great deal of ability to adapt to technological change and over 99% responded that they were somewhat to a great deal willing to re-train or upgrade their skills. These findings support the notion that employees felt they had the ability and willingness to adapt and upgrade their skills in response to technological change.

Although less than 20% of the respondents reported spending 80% or more of their time actually using advanced technology, over 88% of the employees saw themselves as using advanced technology somewhat to a great deal in their job. Over 83% reported that technology made their job somewhat to a great deal easier and over 81% felt technology contributed somewhat to a great deal to their job satisfaction. Similarly, over 82% of the employees answered that new technologies contributed somewhat to a great deal towards improved work performance for them. These results suggest that employees at Co-op Life viewed themselves as substantial users of advanced technology and that this technology generally made their jobs easier and more satisfying as well as contributing to improved individual work performance.

An interesting finding was that those employees who spent a greater deal of their time actually using advanced technology in their jobs, reported that advanced technology contributed more to their job satisfaction, made their jobs easier, and contributed more to their work performance than it did for persons who used advanced technology less. Conversely, those employees who reported using technology less often in their jobs perceived communication as being more open among employees and a greater use of team as opposed to individual problem-solving than did those persons who used advanced technology more. These results suggest that the more time one spends using advanced technology, the less open communication becomes and the more problems are solved on an individual as opposed to a team basis.

In response to the implementation of new technologies at Co-op Life, about 75% of the employees indicated that they had to learn somewhat to a great deal of new skills to keep up with new technologies and changes. Interviews clearly indicated that new skills learned consisted primarily of how to use and operate a computer terminal and being prepared to continuously learn in

response to constant change, both technological and otherwise.

These results clearly identify the conflicting pressures that employees face during periods of rapid and sustained technological change. Both the potential of the new opportunity and the fear of both adapting (the bored automation) and not adapting (job loss) are apparent in the results. This review also makes it clear that the corporate and managerial approach to change through job security guarantees, retraining, and level of individual support can play a critical role in forming these attitudes. Nonetheless, the basis of the dichotomy remains in spite of a lengthy period of managing the change.

TECHNOLOGICAL CHANGE IN THE WORKPLACE

Adapting to New Technologies

Technological change has been an integral part of Co-op Life for almost twenty years, during which time the majority of manual and paper-based operational systems have gradually been automated. Systems automation at Co-op Life has followed industry advances in both hardware and software, with most departments revising or upgrading systems every few years.

This period of technological advancement at Co-op Life can be characterized by an era of transition or change which has permeated the organizational fabric of the firm. Employees report feeling generally comfortable about and accepting technological change as normal at Co-op Life, suggesting that the process of automation and technological transition has become an established norm.

All factors point to the continuation of this era for many more years. As long as technology continues to advance and there is potential to significantly improve office productivity, cost-effective technological change will occur at Co-op Life. It is reasonable to assume that sometime in the future, perhaps thirty or forty years from now, the pace of change may slacken somewhat and the current era of relatively rapid technological change will be displaced by one of relative technological stability.

The effects of technological change on shifts in occupational needs at Co-op Life have been confounded by continued business growth and a history of departmental and organizational mergers and re-structurings. In many cases, records and to a lesser extent, personal recollections about past changes simply do not exist. This further complicates the matter of drawing valid conclusions about the effects of technological change on employment shifts at Co-op Life.

Employment Effects

Interviews with senior management indicated that continued business growth and economies of scale have made technological

change cost-effective and hence, an attractive alternative to proportionate increases in the size of the work force relative to the increased operational demands created by business growth. The effect of this change has been a gradually increasing rate of productivity on a per employee basis, particularly at the clerical or production worker level. In the actuarial department for example, productivity for certain functions has increased by a factor of approximately four times since the introduction of advanced technologies.

Co-op Life has experienced no significant job loss primarily as a result of the mitigating effects of continued business growth. It is anticipated that subsequent business growth will continue to counter the effects of technological change on job loss at Co-op Life in the foreseeable future.

Similarly, potential employment gains as a result of increased business growth will be mitigated by increases in productivity due to continued technological change. Output from the actuarial department rose from 20,000 policies in 1960 to 120,000 through automation although the number of staff remained constant. In absolute terms then, the combined effect of technological change and business growth at Co-op Life has caused little impact on shifts in occupational needs. Minor exceptions would include the creation of internal systems co-ordinator and analysts positions.

Yet technological change has led to difficult periods of employment adjustment particularly during the introductory periods. New systems in the Life Administration and the Group Insurance departments would displace approximately 12% of the staff. Long term human resource planning and retraining is critical to the corporate management of this process. In the case of the Co-operators, temporary staff has become a central element of the transition. Although the internal corporate issue is resolved through this process, the lay-offs are transferred to the society and economy at large.

The point remains however, that with all other factors held constant, technological change is a major contributing factor to specific job elimination as a direct result of productivity increases. In relative terms, it may therefore be concluded that technological change at Co-op Life is, and will continue to be, largely responsible for a shift towards decreasing occupational needs, particularly at the clerical production level.

One might also speculate that the insurance industry specifically, and the service industry in general will also experience decreasing needs for production level workers consistent with assumed productivity increases afforded by the implementation of advanced technologies. Subsequent research could verify this speculation both within and between the insurance and service industries.

Changing Skill Requirements

Consistent with a history of progressive technological change at Co-op Life is the general finding that shifts in skill needs centre around both technological advances and change in general. Almost without exception, employees interviewed mentioned that more computer/systems knowledge and particularly, increased terminal/keyboard familiarity are becoming required skills.

This trend appears to have started with the introduction of the first automated system at Co-op Life in 1967 and has continued to accelerate since then. Management and workers alike clearly indicated that in the not too distant future, all Co-op Life employees will need at least some basic skills and familiarity regarding systems and/or computer operation. It was also made evident that PC use at Co-op Life will likely increase substantially within the next few years, which in turn will cause a shift in skill needs towards greater proficiency and PC operation.

A large majority of employees indicated that the ability to continuously learn has become a required skill in itself and that those employees who are unable to adapt to and learn about changes are likely to be "left behind." It may be reasonably concluded that technological change and change in general has caused a shift in skill needs towards an increased ability to continuously learn. If current trends at Co-op Life continue, it is likely that this "mode of continuous learning" and adaptation will become further entrenched, perhaps to the point of becoming a demonstrated job skill requirement.

Another shift in skill needs noted during the current study included a trend towards higher professional, technical, and managerial skills and qualifications. This shift however, seems to be more closely associated with competitive and professional demands within the insurance and financial industry than with technological change at Co-op Life.

As with shifts in occupational needs, the current study did not address shifts in skill needs beyond the immediate boundaries of Co-op Life. It is evident, however, that a host of skills including programming, systems design, systems analysis, and computer maintenance, to name a few, have become required in the high-tech support sector. Further research might examine these shifts in skill needs in greater detail across industries in relation to the introduction of new technologies to the office environment.

Managing Technological Change

With respect to anticipated, massive changes in the workplace caused by technological change and cited in the literature (Science Council of Canada, 1982), the current study has indicated, at least at Co-op Life, that change has been rather gradual and evolutionary in nature. This may be due in part to the conservative nature of the insurance industry. Certainly the impacts of techno-

logical change have been more immediate and dramatic in other sectors such as the automobile industry.

Results from the current study suggest that technological change at Co-op Life has been a generally positive matter. Reports of increased productivity, job satisfaction, job flexibility, and task variety have been noted to a greater extent than many opponents of technological change might suggest. This raises the issue of what conditions or variables determine positive or negative outcomes of technological change in particular work settings and is certainly worthy of additional research.

In the Co-op Life example, a positive organizational climate and an underlying management attitude of genuine concern for employee welfare certainly contributed to outcomes which have been more positive than negative. This humanitarian attitude or orientation towards workers at Co-op Life indicates that prevailing management attitudes can have a significant impact in determining the quality of working life with respect to technological change. More importantly, it suggests that management in general is largely responsible through its behaviour for determining how technology will be implemented and whether or not the consequences will be positive or negative.

Technology and the Economy

It is clear that technological change does not necessarily have to contribute to negative outcomes. Positive employee attitudes in general about technological change at Co-op Life clearly support this notion. These findings also support Long's contention (1984) that managerial values and beliefs, not the technology itself, are the prime determinant in dictating which outcome will prevail.

There are many potentialities, implications, and issues which arise from technological change and given the scope of the present study, several are worthy of mention. For example, shifting occupational and skill needs as a result of continued technological advances will almost certainly alter the current employment picture in Canada.

With an apparent decreasing need for production-type workers, both in the plant and the office, the spectre of relatively higher unemployment levels, especially for people with minimal skills, becomes a more probable scenario. Accordingly, the problem of finding entry-level, employment opportunities for low-skilled people will likely become more critical.

If unemployment increases as a result of technological change, what will be the responsibility of corporations, government, and society at large to ensure at least the opportunity for gainful employment? What can unions, employee groups and employers do to ensure that technology is introduced effectively and in the best interests of their group and society at large?

Shifts in occupational and skill needs will also impact on other areas of our society. For example, are we adequately preparing and training young people through the educational system to meet projected needs? Will companies invest in more comprehensive training programmes in response to the needs determined by technological change? Will older persons be able to adapt to shifting needs as well as or as easily as younger people? Will women or other identifiable segments of the population be more severly impacted by changing needs than other segments and if so, how will the disparities be resolved? This list is endless.

Similarly, a number of issues relating specifically to work remain salient. For example, will job-redesign and employment options such as job sharing be facilitated by technological change? Will we have a shorter working week or will more people have no working week at all? Will the variety and flexibility of jobs tend to increase or decrease? Again, the list is endless.

The answers to these and many other questions surrounding technological change remain unknown. Certainly our underlying values and beliefs will have a significant impact on which scenarios will prevail. Technology appears to be a catalyst which can facilitate either outcome.

APPENDIX A: METHOD

Subjects

The present study involved all employees (n=166) of the Co-operators Life Insurance Company and employees of the Co-operators Group (n=33) in the personnel services and investments departments that are closely associated with the Life company. Employees ranged from less than twenty years of age to over fifty-five years of age with a mean age range of twenty-six to thirty years. Subjects were located in two office buildings; in Regina, Saskatchewan (n=158), and Guelph, Ontario (n=41).

The "average" employee has worked full time for Co-op Life for three to four years, earns between $15,000 and $20,000 per year, has completed at least some college or professional insurance courses, and spends less than 40% of her time actually using advanced technology. Approximately 80% of the employees were female.

Setting

Co-operators Life Insurance Company is a co-operative owned, Canadian insurance company which develops and underwrites life insurance products for individual, group, and credit union consumers throughout Canada. Offices are located in both Regina, Saskatchewan (headquarters) and Guelph, Ontario.

Instruments

Structured Interviews

Bowditch and Buono (1982) suggest that discussions and interviews with an organizational cross-section of managers and employees can "... lend important insight into the general climate and style of the organization." Furthermore, they suggest (1982) that this sort of "background work" is very important in determining subsequent survey questionnaire items that are both related and meaningful to the organization.

A small sample (n=20) of Co-op Life employees representing all organizational levels and products, were formally interviewed in order to develop a general understanding of the organization's operation; and to generate issues and concerns for the development of a subsequent, company-wide questionnaire appropriate to the expressed needs and concerns of all employee groups. Structured interview questions (Appendix D) focussed on three areas: demographics (to identify various groups within the organization); technological change (to develop a 'sense' of employees' knowledge and concerns about technological change); and working conditions (to develop an understanding of the general quality of working life (QWL) of Co-op Life employees).

Unstructured Interviews

Where appropriate, unstructured interviews and informal dis-

cussions were held with various employees in order to gather information relating to organizational norms, company evolution and history, the chronological introduction of new technologies and systems, and the impact of technological change on shifts in occupational and skill needs. The resource persons informally interviewed were identified through consultation with members of the Advisory Group (an internal support group at Co-op Life which advised the researcher during the course of the study) and other Co-op Life employees.

Internal Documentation

Internal documentation such as reports, memos, policy manuals, and other written material was used where appropriate to validate data from other sources and as an original source of data where other means were not available.

Survey Questionnaire

Research (Bowditch and Buono, 1982; Golembiewski and Hilles, 1979; French and Bell, 1978; and Nadler, 1977) indicates that survey questionnaires have proven to be a valuable tool for measuring trends in employee perceptions and in improving organizational performance. Bowditch and Buono (1982) maintain that survey questionnaires are the most widely used technique to obtain information from a large number of employees and they are particularly useful for studies of beliefs, attitudes, and values. In addition, survey questionnaires are relatively economical to administer and they lend themselves well to quantitative analysis. Other research (Aldefer and Brown, 1972) indicates that survey questionnaires, which reflect familiarity with the key issues and concerns of a particular organization, appear to achieve better quantity and quality of information than do survey or 'canned' instruments.

The questionnaire focussed on three main areas: demographics (to identify various groups of interest for subsequent comparative analysis; e.g., Regina vs Guelph location, individual life vs group life employees, etc.); technological change, including shifts in occupational and skill needs (to determine the perceived impact of technological change on Co-op Life employees and their associated concerns); and working conditions or general QWL (to determine how employees perceive certain aspects of their employment; (e.g., job satisfaction, opportunity for advancement and personal growth, informal communication patterns, etc.).

Item design included: open-ended questions which Bowditch and Buono (1982, p. 71) suggest provide for "... richer data and deeper insight into specific issues . . .;" and closed-ended scaled questions which can be quantified and interpreted "... in a much more straightforward manner." Since the reliability of Likert-type scales is generally good (Oppenheim, 1966), a seven-point, Likert-

type scale was used where appropriate, for all the closed-ended survey items.

Procedure

Structured Interviews

Potential interviewees were identified and selected by members of the Advisory Group, based on the following criteria:

1. That at least one person representing each product and organizational level within Co-op Life be interviewed
2. That the Guelph location be represented relative to the total number of Co-op Life employees
3. That interviewees will be randomly selected by the researcher from the list of potential persons as identified by the Advisory Group.

All interviewees were contacted on the telephone by the researcher to explain the purpose of the interview and to arrange an appropriate time and location for each party to meet. Phone interviews were conducted with the Guelph employees in those instances where a personal meeting was not practical.

Immediately prior to the interview, the interviewees were made aware of: the purposes of the study and the interview; the issue of confidentiality; their right of choice to participate or not participate in the interview; and their access to study results upon completion. Interviews ranged from forty-five to ninety-five minutes in duration.

Employee Questionnaire Survey

Bowditch and Buono (1982) contend that a population survey is preferable to a sample survey because it provides for greater institutional credibility, lends itself to simpler analytical techniques, and provides for easier interpretation of the data. Accordingly, the entire Co-op Life population, minus those employees on holidays, leaves, etc., were administered the questionnaire to complete at their place of work.

As advised by Bowditch and Buono (1982), prior to the administration of the employee questionnaire survey (survey), a small sample of employees was pilot tested in order to assess and rectify ambiguous questions, readability problems, and response clarity. Immediately following the pilot test, test respondents and the researcher led a group discussion in order to identify and address any problems with the survey.

A return-addressed envelope was included with each survey as well as a statement guaranteeing confidentiality of responses, access to aggregate results upon study completion, and the right not to participate (Dillman, 1978). The independence of the researcher was established through the previous distribution of a formal memo to all employees as developed by the Advisory

Group. Given that the research findings might clearly influence the employees future work organization, it was anticipated that all respondents would be concerned to provide full and considered responses.

Optical scanning (OPSCAN) sheets were used by the respondents for answering all closed-ended items. Ample space was provided on the survey itself for respondents to answer the open-ended questions and to add personal comments.

The survey was distributed to all Co-operators Life Insurance Co. employees at both the Guelph and Regina locations on the same day. Respondents were given from four to seven days to complete and return the survey. To help ensure a good response rate, responsibility for the distribution and collection of the surveys was assumed by department directors or their delegates. In addition, a memo signed by the vice-president was forwarded to all employees two days after survey distribution reminding respondents to complete and return the survey as per the original instructions.

Analyses

The use of Likert-type scales for the closed-ended survey items allowed for ordinal ranking measurement of quantitative data that could be interpreted in a comparative manner. The Statistical Package for the Social Sciences, Edition X computer programme (SPSS X) was used to calculate frequencies, means, and standard deviations for each survey item.

Cross-tabs programmes were used to statistically compare differences between demographic variables and breakdown programmes were used to statistically compare item responses by demographic categories. Chi-squared statistics were used to determine statistically significant differences between demographic variables. Analysis of variance (F Tests) were used to determine statistically significant differences between demographic groups and various item responses assuming that the ordinal data generated from the Likert-type scales approached interval data standards (Bowditch and Buono, 1982).

Open-ended survey questions and structured interview responses were analyzed using both differential and integrative techniques (i.e., a content analysis) where appropriate as outlined by Bowditch and Buono (1982).

APPENDIX B: TECHNOLOGICAL DEVELOPMENT ON A DEPARTMENTAL BASIS

The new technologies have seen application at a departmental level. The following reviews the use and introduction of new facilities in terms of:

1. Functions performed
2. A description of the systems employed
3. The effects of systems employed on shifts in skill and occupational needs
4. Projections regarding new technological innovations.

Life Administration

Life Administration has over eighty-five employees at both the Guelph and Regina locations and is the largest department at Co-op Life. There are two similar units in the life administration department: the Guelph unit (formerly CIA Life) which underwrites and services individual life insurance policies in the Ontario region; and the Regina unit which develops, underwrites, and services individual life insurance policies in the rest of Canada. Each unit, which is headed by a manager who reports to the Director of Life Administration in Regina, performs four main functions: policy holder service (e.g., customer enquiries); underwriting, which is responsible for risk selection; billing and collection; and clerical and processing, which handles new business.

Both locations also have a systems co-ordinator/administrative analyst person who is responsible for acting as a systems project leader and as a liaison with systems support people from Co-op Data and other external vendors. In addition, the Regina location also has a marketing services person who reports to the Director and provides field support for the sales and distribution people in the General Insurance company. Approximately two-thirds of the employees in this department are clerks of one sort or another.

The current life administration computer system was developed several years ago and consists of a series of inter-dependent but not fully integrated sub-systems. Each sub-system operates as a master file which is updated on a batch basis. In 1982, when Co-op Life was formed, the Guelph location converted their existing system to the system in place at Regina. For a variety of reasons, the changeover in Guelph required considerable effort which in turn hindered the maintenance and on-going development of the total system.

The individual life system (LSC/LFA) handles both individual life and deferred annuity products. The CPUs in both the Regina and Meadowvale locations are linked such that data from Guelph/Meadowvale can be input and forwarded to Regina for

subsequent processing. The LSC/LFA includes the following sub-systems:

1. Applications — controls the assigning of policy numbers and sets up name, address, and information records for these policies
2. Name/Address — contains the name and address information required for correspondence
3. Information — maintains policy information which is not required for daily processing activities such as sex and birthdate but is necessary for reports and policy administration
4. Policy Issue — controls the issuing of policies and creates records for other sub-systems as required
5. Deferred Annuities — maintains policy information for deferred annuities on registered and non-registered plans and calculates interest at variable and guaranteed rates
6. Premium — maintains premium information on all policies. It records payments, bills the policy holder, changes status due to non-payment, and will automatically issue premium loans if premium has not been paid and the policy has sufficient cash value. It also provides statistical information for administration
7. Pre-authorized Cheques — maintains banking information for all pre-authorized payments and acts as a sub-system to the Premium sub-system
8. Dividend — maintains dividend information on those policies eligible for dividends and provides statistical information for administration and for accounting and reserve purposes
9. Loan — maintains information on policyholders who have obtained a loan using their policy as collateral and provides statistical information for administration
10. Reserves — maintains reserve information (i.e., a portion of premiums required by law to be set aside as a liability fund for the protection of the policyholder)
11. Agents' Interest — maintains agents' commission information and produces statistical information for administration.

In addition, the life administration unit in Regina handles the processing for two special life plans through a separate subsystem. The LSC/LFA system interfaces with (i.e., supplies information to) other systems within Co-op Life and The Co-op Group such as the general ledger, accounts payable, and investments systems.

The input for these sub-systems is by key-edit, and on-line data entry through computer terminals. Most data is processed in a batch mode (i.e., some time after the data is entered) with a small amount of processing completed on an on-line, realtime basis (i.e., processing occurs immediately).

A significant portion of the key-editing is preceded by the task of manually entering data onto code sheets for subsequent key-edit entry. This step is necessary primarily because the sub-systems are not fully integrated and the same data may have to be entered separately onto different sub-systems. The new system being proposed for life administration would remove the step of recording data onto coding sheets by allowing direct, on-line data entry via a computer terminal and by simultaneously changing information on the other appropriate sub-systems.

This new system (CAPS-I-L) will be introduced within the next two years and should improve the current system by simplifying and streamlining the work flow within the functional areas through the automation of certain job functions. CAPS-I-L will reduce the amount of manual calculation and data entry required and likely decrease data entry error rates in addition to providing faster turn-around time on policy changes through realtime processing. The proposed system will also provide greater system flexibility than the current system by its ability to more easily accommodate new products as well as further standardize systems operations between the Guelph and Regina locations.

In short, the proposed system is more automated, integrated, and comprehensive than the current system and should decrease the volume of clerically initiated financial transactions. It will reduce margins for error and improve the timeliness and accuracy of financial data and information available to Co-op Life.

A preliminary study conducted by the vendor (external to The Co-op Group) indicates that approximately nine positions total will become redundant between the Guelph and Regina locations. The largest impact will probably be in the policy holder service area.

Consistent with Co-op Life's policy of employment security for full-time employees (not to be confused with specific job security), a trend suggesting continued business growth, and normal job attrition (e.g., retirement, leaves, etc.), no direct employment loss per se is anticipated from the introduction of new technologies and automated systems. It must be concluded, however, that occupational needs in the life administration area, particularly those at the clerical or production level, will be affected by technological change.

Since the new system will alter existing work flows and procedures, the need has been recognized for re-training of some Life administration staff and a possible re-organization within the department. The new system will generate less paperwork through enhanced use of on-line data entry, so there will be an attendant need for improved keyboard and data entry skills by "production" workers. In addition, production workers will be required to have more breadth of knowledge about the system in general, which

will likely lead to less specialized and more generalized system knowledge than is required for the present system.

It is anticipated that the new system will reduce the number of mundane and repetitive tasks currently performed as more responsibility for data entry, access, and manipulation is assumed by individual workers. As skill needs shift towards greater system knowledge and expertise, it is expected that proportionately more employees will "move up" the grade/pay scale as opportunities for advancement improve.

The life administration area is one of the few examples at Co-op Life where the effects of technological change on shifts in occupational and skill needs can be readily identified. Even so, direct loss of employment as a result of technological change will not occur, partly because of the mitigating effects of normal attrition and continued, significant business growth. There will be less of a need for clerical-type workers with paper-based skills in response to the demand for workers with the skills to understand and operate a comprehensive computer system.

As opposed to radical shifts in skill needs, the proposed system will likely entail a general enhancement of existing skills in keyboard familiarity and system knowledge. This shift will likely be gradual and evolutionary in nature.

Another salient issue which deserves mention is the fact that new systems are rarely, if ever, introduced on an 'overnight' basis. Typically, the development and implementation of new systems within any Co-op Life department occurs over an extended period of time (two years is not uncommon) which further confounds the process of identifying direct effects of technological change on shifts in occupational and skill needs. In the present example however, the impacts of technological change appear relatively straightforward.

Group Insurance

The group insurance area, with approximately forty employees located in the Regina office, is the second largest department at Co-op Life. The following illustrates the various functions performed:

1. Risk Management and Marketing Support — providing advice and consulting support to geographic division personnel and to policyholders; monitoring policyholder account status; and research and development of new products, changes to current products, and communication to field sales staff
2. Underwriting — selection of individual and group risks and rating of premium within pricing policy parameters set by actuarial
3. Administration — policy billing and collection; production of statistical information for external regulatory agencies

4. Claims — adjudication and control of employee benefit and life insurance claims (this area is soon to be de-centralized and the function will expand to include some field training)
5. Pensions — marketing, underwriting, administration, and benefits payments for pension plans
6. Actuarial — to determine pricing of employee benefits products as determined by corporate actuarial.

In addition, a need has been recognized for an Information Management function to develop more efficient methods for handling information among the various systems. This function is currently not being done.

The group insurance area has several systems, some of which are comprised of sub-systems which interface with each other but are not fully integrated. The systems are briefly described as follows:

1. Group Life Administration System (GRL) — This system handles the group life processing for all clients of Co-op Life. It processes life insurance income guarantees and medical, dental, and other forms of employee benefits. It also processes the claims that occur on these coverages. The GRL contains five sub-systems, each of which interfaces with other, external systems such as the general ledger and accounts payable systems where appropriate. Each sub-system is responsible for the storage and maintenance of different kinds of information (e.g., employee, employer, claims, etc.). The major processing functions of the GRL are premium billings, claims payments, and statistical information for both internal and external purposes. Data entry is through both key-edit and on-line methods with processing on a batch and periodic (e.g., monthly or yearly basis). A significant portion of work is still completed manually on some of these systems.
2. Group Pension Administration (GPA) — This system handles pension administration for policyholders. It records money for deposit, keeps track of individuals' and companies' contributions, produces government forms, calculates interest, and maintains pensioner information. The GPA is an automated record keeping, accounting, and information processing system. Data is input from key-edit files containing the various transactions manually coded by group life personnel. Processing is completed on a batch and periodic basis
3. Agent's Pension — The agent's pension system is a computerized system which records agent's pension information, calculates interest, computes withdrawal information for policy terminations and claims, and provides management reports. Data input is by manual coding and key-edit and from an external system. Processing is completed on a weekly, batch mode basis

4. Auto Life (AUL) — This automated system handles the processing of life insurance that is purchased with an auto policy. It prepares statistics for the group life statistics message file and produces financial reports. The AUL interfaces with the general ledger system. Manual coding and key-edit is used for data entry with processing done on a batch and periodic basis
5. Hour Bank (HBK) — This automated system handles life insurance for two Alberta unions and is designed to maintain information and process premiums and issue notices. This system is used primarily by underwriters in the event of a claim.

Systems have been in place in the group insurance area for approximately ten years and have automated, to a greater or lesser extent, many of the manual tasks previously required. The current claims sub-system was brought on stream in 1979 and the GRL was upgraded in 1983. Although the main reliance is still on paperwork for many of the systems, technological change in the group insurance area has generally provided for more immediate access to information through increased processing speed and a decrease in the amount of paper-shuffling between systems in other departments.

Within the next year, a new system will be installed in the dental and medical claims area which will eliminate the need for manual coding of data and claims calculations. This new system will subsequently impact on the total group administration area as well.

It is anticipated that four to six temporary, full-time positions will be lost due to this upgrade. No full-time positions will be lost however, as management was aware of the pending system change and with normal attrition and movement within the area in the last year, had hired several temporary employees instead of full-time staff.

During the last ten years of technological change in this area, there has been an increase in the number of jobs. This is evidently attributable to both substantial business growth and to the creation of some task duplication as in the case of the manual coding and key-edit data entry functions.

As more reliance on advanced automated systems occurs, less paperwork and fewer multiple data-entry points will be required such that productivity on a per employee basis will dramatically increase. This will effectively remove the need for some production workers, specifically coding, claims, and filing clerks. The effects of the new system will first be noticed in the medical and dental claims area with the elimination of several clerical positions.

The effects of technological change on shifts in occupational needs in the group insurance area over the last ten years are difficult to identify because of departmental re-structurings, busi-

ness growth, and a lack of appropriate, historical data. It is reasonable to assume however, that technological change has increased productivity at production worker levels; hence, the need for clerical-type workers has not kept pace with increases in business growth.

This trend is expected to continue in the foreseeable future with the introduction of new systems such that fewer and fewer clerical and production-type workers will be required in relation to current and projected business needs. The effects of continued automation such as direct loss of employment will likely be mitigated by continued business growth.

The effect of technological change on shifts in skill needs is also difficult to identify. During the last ten years, there has been a demonstrated need for some system knowledge and terminal keyboard familiarity skills at the production worker level, however the new system to be introduced might affect skill needs in a number of ways.

In some areas (e.g., claims), employees have speculated that the new system will lead to a greater degree of stratification and polarization between occupational groups with different skill needs. For example, relatively unskilled workers might be required for the simple and repetitive data entry function while more highly skilled people with professional accreditations (e.g., nurse or dental technician) will be required for the claims examiner function. Conversely, there have been suggestions that in some areas, production workers will be required to perform a variety of tasks which will demand more general systems skills than are currently required.

In the case of the group insurance area then, it appears as if technological change may simultaneously create some jobs that need people with considerable skills and other jobs that require people with only minimal skills. Similarly, occupational needs may be defined by technological advances that create both simpler, more repetitive kinds of jobs as well as jobs which will be more challenging and complicated.

Clearly the group insurance area is in a state of transition with respect to technological change. As systems continue to improve and move further towards being computer- as opposed to paper-based, shifts in both occupational and skill needs will occur. All things considered, it appears as if fewer production-level workers will be required in the future in relation to the amount of business currently handled and that employees will generally be required to have greater systems knowledge and expertise than is currently the case. In addition, current indications suggest that there will be a need for a small number of professional-type positions.

Credit Union Insurance

The credit union (CU) insurance area employs approximately thirty persons at the Regina location and performs the following functions: processes CU claims and pays out policy benefits; underwriting which sets premium rates as determined by risk; administration which handles premium collection and the processing of relevant statistical information; risk management and field support which provides marketing and training support for regional offices; and communications for CU advertising and promotions.

The CU area develops and underwrites insurance products which are highly specialized to meet the individual needs of its credit union clients. This degree of product specialization where each product is essentially unique and relatively small, severely limits the potential to implement an automated system which is both cost-effective and meets the needs of all clients. Accordingly, the CU area 'piggy-backs' or shares systems that are used in other departments. For example, monthly premium collection is handled through the individual life system (LSC) (and CAPS-I-L when operational) and some additional work is processed through special life products system (SLP). As well, CU insurance ties into the group life administration system (GRL) for purposes of providing information into the corporate ledger system.

One system which is used solely by the CU area is the credit union life system (CRU). The CRU processes term transactions and issues notices for the insurance covering credit union loans and savings in the event of a member's death. This system which has been in place for several years, will require some minor revisions in the future but it is anticipated that it will continue on for many more years.

Input for all CU systems is through a combination of manual coding/key-edit and on-line terminal entry. Processing is handled on a batch and periodic basis.

Owing to the rather unique design of CU insurance products, most record keeping is and will continue to be performed manually. Any improvements brought about by technological change will have less of an emphasis on improving manual processing capabilities than on improving data access and manipulation primarily through realtime applications on other departmental systems.

Since past technological innovations applied in the CU area have only marginally decreased the amount of manual work required, no shifts in occupational needs as a result of technological change have occurred. The main advantage of technological change has been in an improvement in the speed of access and delivery to limited forms of information. Management anticipates that future staff increases will be proportionate to increases in

CU insurance growth only and should not be affected by technological change.

Even though the systems that CU insurance currently shares with other departments are not entirely appropriate to CU insurance area needs, they are adequate. The prohibitive cost of developing a separate system for each product leaves few alternatives for the CU department.

One alternative to continued 'piggy-backing' or the development of one comprehensive system, is an increasing use of personal computers (PC) and specialized software packages for each CU product. This alternative is currently being explored within the department as a cost-effective means for further automating its operations consistent with meeting the processing needs for its clients' products.

If PCs are chosen as a preferred alternative to the current arrangement, no shifts in occupational needs are anticipated as the PCs would simply replace the current paper-based system without eliminating any of the tasks currently performed. As long as product flexibility remains the prime determinant in applying new technologies in the CU area, it is unlikely that substantial systems changes will occur.

Another alternative to the current situation is the possibility of tying into other, new departmental systems which have a greater degree of product flexibility inherent in their design. Again, cost-effectiveness on a product by product basis will be a determining factor and indications suggest that if this were to occur, it would be several years down the road.

Shifts in skill needs as a result of past technological change appear to have been minimal. There has been some involvement with terminals and systems requiring a general upgrading of systems and terminal keyboard operation but only in a few isolated instances. The introducton of PCs however, would probably require that several people upgrade their computer skills.

Interviews indicated that an attitude of continuous learning was already in place within the department among employees. Any new technological change would likely further entrench this attitude.

Actuarial

The actuarial department has roughly eighteen employees in the Regina location who perform the following functions: pricing of all Co-op Life insurance products including the calculation of reserves on a policy by policy and volume basis; ensuring the continued solvency of Co-op Life; and ensuring the validity of all data and systems. Accordingly, the actuarial department has access to information from all existing systems with Co-op Life, both on-line and in periodic form. As well, this department liaises closely with the investments and controller departments.

The actuarial department does not have separate systems of its own. It does, however, use PCs and commercial software programmes for specific calculations and equation-solving problems (e.g., reserve calculations and pricing).

Over the last several decades, the actuarial function has remained essentially unchanged. Technological change has, however, allowed for the automation of some very repetitive and time-consuming tasks such as volume reserve calculations and volume mailings of RRSP receipts. Many of these tasks are now performed via systems in other departments.

Technological change appears to have contributed significantly to increased productivity and to shifts in occupational needs as well. Whereas an actuarial staff of about twelve persons in 1960 was able to manually perform the required actuarial functions for 20,000 policies, the current staff of eighteen persons is able to service over 120,000 policies. It is apparent that new technologies have decreased the need for much larger numbers of staff in relation to increases in business growth. As well, technology has decreased the number of repetitive tasks that individuals are required to perform.

The department has traditionally employed a high proportion of professional people, as have the accounting and investments departments. There has been a gradual shift towards upgrading academic and professional skills over the years; however, technological change does not seem to have contributed to this trend in a significant manner. Marginal shifts in skill needs identified within the actuarial area at Co-op Life include an increasing familiarity with PCs and computer systems in general.

In short, technological change in the actuarial area may be viewed as a new means for accomplishing traditional ends. Shifts in occupational needs have changed only with respect to relative increases in business growth and no new occupations have evolved as a result of needs generated by technological change. Conversely, shifts in skill needs seem less affected by technological change than by increasing demands for better qualifications and more expertise within the profession.

Controller Department (Accounting)

The accounting department at Co-op Life currently employs about nine people at the Regina location who perform four essential functions: financial reporting, including the development of all internal and external financial reports and documents; financial analysis, including budgeting, planning, forecasting, costing, project cost analysis, and other financial performance matters; accounting control, including the development of control mechanisms for financial and computer systems; and cash management and processing such as the receipt and payment of funds and liaising with the actuarial and investments departments.

As with the actuarial department, accounting receives pertinent information from all automated Co-op Life systems. This department also operates three systems, two of which are processed through on-line terminals connected to the CPU at Co-op Data.

The first system, MSA-GL, is a general ledger system which has been in operation for over fifteen years. The MSA-GL categorizes and updates all financial accounts and produces financial reports on a periodic and as needed basis. The MSA-GL interfaces with most other systems at Co-op Life and will probably remain operational for another five to ten years given its inherent flexibility.

The second system is an accounts payable system which records all financial payments within Co-op Life and automatically generates cheques and account statements on an on-going basis. This system has also been operational for several years and has been revised and upgraded to its current on-line, batch processing status.

The third system, which is currently managed on a PC, is being used on an interim basis to replace the previous budget system which was operational from 1975 to 1983. Although the current PC budget system is not fully appropriate for all of Co-op Life's budgeting needs, it is proving to be quite adequate given its short-term function.

The pending budget system, MSA-Budget, will be introduced within the next year. When fully operational, it will provide a means to input budget data on specific accounts and to allow for financial comparisons with accounts in the MSA-GL system. Generally, the MSA-Budget system will enhance the efficiency for input, manipulation, and retrieval of budget data.

The accounting department has had little increase in staff numbers over the fifteen years. Increases that have occurred have been due to new business needs for financial planning and analysis and do not reflect needs generated by technological change.

There has been a substantial increase in productivity due to implementation of the budget, accounts payable, and ledger systems as indicated by continued business growth and a relative decrease in the number of staff required to complete the accounting functions. It may be reasonably concluded that technological change has generally reduced the need for more staff relative to increases in business growth.

Aside from a continued trend indicating greater demand for higher academic and professional qualifications, technological change has had only a marginal effect on shifts in skill needs within the accounting department. The main impact appears to be on a gradually increasing need for more and better PC and systems familiarity skills.

Research and Planning

The research and planning department which is staffed by two persons plus part-time support from two other persons, conducts research and develops plans directed primarily towards marketing issues. Although it falls under the control of Co-op Life, services and expertise are also extended to other Co-op Group companies on a consultative basis as requested.

In the past, this department did not focus strongly on basic research, however, more emphasis will be placed on this area in the future. The majority of the current effort focusses on conducting consumer and market surveys and cohort surveys with other co-operative organizations.

The department has one computer terminal through which data is manipulated on several statistical software packages. The research and planning department has no internal databases to access; however, it does access several industry data bases (e.g., insurance, census, and survey data) through an external, computer services firm. These external data bases are not on-line (i.e., available on terminal). Essentially all data used by the department must be entered on the terminal. The department also maintains an extensive, hard-copy library (i.e., books, periodicals, reports, etc.) as a data source.

The department does have on-line access to and retrieval from a few data bases such as the Dow-Jones and (Toronto) *Globe and Mail* data bases; however, these are used infrequently within the area. It is expected that an internal data base with on-line access for pertinent Canadian statistics on a geographic basis will be available for use within two years.

The department has recently purchased a software programme for use on a PC which will allow for the development of a modular financial model of Co-op Life. This system will allow the department to create different financial scenarios based on the data input into each module (e.g., actuarial, marketing, etc.). It is anticipated that the model will be operational within the next year.

Given the relatively small size of this department and the demands placed on it, no significant shifts in occupational needs are apparent as a result of technological change. Shifts in skill needs, however, are identifiable with a clear need for skills such as computer and statistical software systems expertise for research purposes.

Investments

The investments department is responsible to The Co-op Group but because of its physical location within Co-op Life and its close working relationship with several Co-op Life departments, it was included in the current study. The department employs six persons and manages the investment funds to meet the projected financial needs of Co-op Life.

As part of its function, the investment department liaises closely with the actuarial and accounting areas to ensure the continued financial viability of Co-op Life. In addition, it also liaises closely with the investments department in Guelph which provides similar services for the Co-operators General Insurance Company. This approach ensures a consistent and integrated investments approach for both insurance companies.

The investments department operates two automated systems to meet its needs. The first system, ICSS, is a bond and stock system which allows for the storage, retrieval, and manipulation of pertinent information regarding any Co-op Life investment. This system was introduced in 1973 and has undergone several minor revisions since.

Data is entered and stored in a master file through a PC which is tied into the CPU at Co-op Data. Information can be altered on a realtime basis. The ICSS system, in addition to providing information on an immediate basis, also provides periodic income reports, listings of investment holdings, and schedules of investment notices by date. It is anticipated that this system will continue in place with only minor revisions for many years to come.

The second system, MTGM, provides basically the same functions as the ICSS system except that the information and data relates specifically to mortgage investments. This system was also introduced in the early 1970s but has undergone no revisions since it became operational.

The MTGM system is likely to be upgraded within the next few years to allow for realtime processing of data as with the ICSS system. This revision will eliminate the task of manually coding data onto coding sheets; however, it will have no effects on shifts in occupational needs as this task currently takes up very little time.

The main difference between the two systems is that data entered into the MTGM system is manually coded by investment staff onto code sheets for subsequent key-edit data entry by Co-op Data staff. As well, processing is done on a batch as opposed to realtime basis.

Both the MTGM and ICSS systems interface with systems in the accounting department to ensure the integrity of accounting procedures. In effect, the MTGM and ICSS systems automatically report financial gains or losses in the investments and mortgage portfolios to the accounting system.

The investment department does not currently have access to external investment data bases, choosing instead to deal personally with professional mortgage and investment houses. Within the next two or three years, the department will likely buy into external data bases as determined by need and the cost-effectiveness of such a move.

Over the last ten to fifteen years, the functions and operations of the investments department have remained unchanged. Similarly, the number of staff required has remained stable. Technological advances through systems implementation have increased the speed of access to information but have had little if any impact on jobs and their associated tasks.

There is no indication of any shifts in occupational needs as a result of technological change in this area even though there is a projected need for a new financial analyst's position within the next three years. This position will likely be created in response to new business demands rather than technological change.

Regarding shifts in skill needs, there has been a trend for better qualified persons both academically and professionally; however, this appears to be largely a result of competitive demands within the industry in general and the profession in particular, rather than as a result of technological change. Shifts that are at least partly attributable to technological change include increased skills in computer and specifically, PC familiarity, as well as the ability to continuously adapt and learn in a rapidly changing environment.

Personnel Services

As with the investments area, personnel services is not a separate department within Co-op Life even though they are currently responsible to and report through Co-op Life. Personnel services was included in the current study, however, because of its close liaison with Co-op Life and its involvement in human resources development (HRD) and planning.

Personnel services provides two main functions for all Co-op Group companies: administrative services, and development. Administrative services includes: personnel administration including payroll, hiring, and office services; office supplies and equipment purchasing; training, including course delivery and administration; community relations, including tours, advertising, etc.; and health centre operation, including nursing and emergency care and employee assistance programme administration. Personnel administration is currently viewed as the primary mandate of personnel services with development receiving second priority.

The development function entails: organization development including job design, organization structure, and career counselling; training, specifically the development of new programmes to meet identified training needs; and affirmative action development and administration. It is anticipated that within the next year or so, each Co-op Group company will assume the development function which may include the hiring of organization or human resource specialists specific to the needs of each company.

Personnel services has had an automated payroll system (CPR) in effect since 1977. The CPR administers the payroll for all Co-op Group employees and maintains benefits information as well as handling tax information and other deductions. This system is essentially financial in nature and produces paychecks for all personnel. It also interfaces with the financial budgeting system in the accounting area.

Personnel services also has an automated pension administration system (PAS) which is run strictly for Co-op Group employees. The PAS is very similar to the group pension system (GPA) described earlier.

Personnel services also has on-line access to an Air Canada ticket reservation system and an internal inventory system which keeps track of all office inventory. With the exception of an interactive orientation training programme available through computer terminals, all other systems within the personnel services area (e.g., performance appraisal system, health records, etc.) are not automated and remain strictly paper-based.

In comparison to other areas and departments of Co-op Life, the personnel services area is not heavily automated. It is anticipated that as the company grows and systems are developed which meet both company personnel needs and cost-effectiveness criteria, the use of advanced technology will increase.

Given the particularly diffuse boundaries of this department, the effects of technological change on shifts in occupational and skill needs were not examined in detail. Interviews with departmental personnel indicated, however, that as more technological advances are introduced, it is likely that an internal operations analyst position will be required to liaise with Co-op Data personnel.

APPENDIX C: THE CO-OPERATORS LIFE INSURANCE COMPANY EMPLOYEE SURVEY QUESTIONNAIRE (September, 1984)

The Co-operators Life Insurance Company (Co-op Life) recognizes the need to consider employees' feelings and concerns regarding the implementation of technological change in the workplace. The next several pages comprise a survey questionnaire which will enable Co-op Life to recognize and address employee needs around technological change.

The study is being conducted by a researcher from the University of Saskatchewan and is funded, in part, by Co-op Life and the Canadian Plains Research Center. Your personal responses will be held strictly confidential and under no circumstances will individuals and their responses be identified in any manner. Reports or publications that may arise from this questionnaire will indicate total or group scores only.

Although your participation in completing the questionnaire would be appreciated, you are entirely free to choose not to complete it. *Please return the questionnaire, completed or not, in the return envelope by September 12th.*

Questionnaire results will be made available to all employees upon completion of the study. Thank you for your assistance.

Malcolm Chadwick

INSTRUCTIONS

This questionnaire is made up of several sections. Each section is designed to determine how you perceive certain aspects of your job. Please follow the instructions listed at the beginning of each section and add any comments you might have in the space provided at the end of each section. The questionnaire should take about forty-five minutes to complete.

Enclosed is an Optical Scanning (OPSCAN) sheet. To answer questions 1 to 93, completely fill in the appropriate number on the OPSCAN sheet with a *soft lead pencil.* There should only be *one answer per question.* If you wish to change an answer, be sure to *completely* erase your first response. Please make sure that your response on the OPSCAN sheet is for the same number item on the questionnaire (i.e., question 20 on the questionnaire should be answered as item 20 of the OPSCAN sheet). *Do not* pencil in any area to the left of the solid, vertical line on side one of the OPSCAN sheet (names, ID numbers, etc. are not required). Note that for the seven-point, 'scaled' questions (questions 11 to 93), do not fill in any 0s, 8s or 9s on the OPSCAN sheet.

For those questions requiring written comments, write on the questionnaire itself in the space provided. If you require additional space for comments, feel free to enclose a separate piece of paper.

SECTION A

DEMOGRAPHICS

This section is designed to identify various groups within the Co-operators (e.g., by type of job, gender, etc.) for purposes of comparison. Please fill in the number of the OPSCAN sheet which best answers the question. Note that comments are not required for this section.

EXAMPLE: 2. Sex (1) Female or (2) Male — if you are a female, you would fill in the 1 on the OPSCAN sheet for question number 2 as in the example below.

A B C D E F G H I J

2. 0 1 2 3 4 5 6 7 8 9

1. Current Age: .. (1) 16-20
(2) 21-25
(3) 26-30
(4) 31-35
(5) 36-40
(6) 41-45
(7) 46-50
(8) 51-55
(9) 56 and over

2. Sex: ..... (1) Female
(2) Male

3. Yearly Salary (include bonuses, commissions, etc.):
(1) under $15,000
(2) $15 to $19,999
(3) $20 to $24,999
(4) $25 to $29,999
(5) $30 to $34,999
(6) $35 to $39,999
(7) $40 to $44,999
(8) $45 to $49,999
(9) $50,000 and over

4. Years of Service with *any* of the Co-operators' companies:
   (1) less than one year
   (2) one to less than two years
   (3) two to less than three years
   (4) three to less than four years
   (5) four to less than six years
   (6) six to less than ten years
   (7) ten to less than fifteen years
   (8) fifteen to less than twenty years
   (9) twenty or more years

5. Office location:
   (1) Guelph
   (2) Regina

6. Current Employment Grade:
   (1) Grade 1 to 5
   (2) Grade 6 to 10
   (3) Grade 11 to 15
   (4) Grade 16 to 20
   (5) Grade 21 or over

7. Main Product Line with which you work:
   (1) Individual Life Insurance
   (2) Group Life Insurance
   (3) Credit Union Life Insurance
   (4) Other (please specify; e.g., staff functions such as audit, personnel, finance, investments, all of the above)

8. Education (please indicate highest level attained):
   (1) completed grade school
   (2) some high school
   (3) completed high school
   (4) some college (include business related courses such as LOMA, FLMI, etc.)
   (5) completed college
   (6) some university
   (7) completed university (undergraduate degree)
   (8) some graduate school
   (9) completed graduate school (Masters degree or higher)

9. Employment Status:
   (1) full time
   (2) temporary full time
   (3) part time
   (4) temporary part time
   (5) on contract
   (6) seasonal
   (7) other

10. How much of your working time involves the use of advanced technology like a terminal, word processor, personal computer, or photocopier?

(1) Less than 20%
(2) 20% to 39%
(3) 40% to 59%
(4) 60% to 79%
(5) 80% and over

SECTION B

TECHNOLOGICAL CHANGE

This section is designed to identify how you and your peers at Co-op Life perceive technological change and its impact on shifts in occupational and skill needs. Technological change can be defined as the introduction of any equipment or system such as computers, terminals, word processing, high speed copiers, and software packages which are designed to improve work productivity. On the OPSCAN sheet, mark the answer which *best* describes how you feel about that question using the *seven point* scale listed below.

EXAMPLE: 16. How hungry are you right now? — if you filled in the 5 on item 16 on the OPSCAN sheet as below, it would mean that right now, you were more than somewhat hungry but not a great deal hungry.

	A	B	C	D	E	F	G	H	I	J
16.	0	1	2	3	4	5	6	7	8	9

* remember, don't fill in 0s, 8s, or 9s on the OPSCAN sheet

1	*2*	*3*	*4*	*5*	*6*	*7*
not at all			somewhat			a great deal

11. To what extent has technological change affected your job within the last few (1 to 5) years?
12. To what extent do you see technological change affecting your job within the next few years?
13. How concerned are you about the effects of technological change?
14. To what extent do you view technological change in the workplace as positive?
15. To what extent do you view technological change in the workplace as negative?
16. How 'comfortable' do you feel about technological change in general?
17. To what extent do you have the ability to adapt to technological change?
18. To what extent do you see yourself as a 'user' of advanced technology in your job?
19. To what extent has technology made your job easier?

20. To what extent have you had to learn *new* skills to keep up with new technologies and changes?
21. To what extent has technological change been introduced too fast at Co-op Life?
22. To what extent has technological change been introduced too slowly at Co-op Life?
23. To what extent are you 'computer literate' (i.e., able to understand and use computers)?
24. To what extent is computer literacy a job skill requirement for you?
25. To what extent should all Co-op Life employees be computer literate?
26. How adequately have you been trained and prepared for using new technologies and systems already implemented?
27. To what extent are the new technologies and systems now in place at work, user 'oriented' or 'friendly'?
28. To what extent should the new technologies and systems be made more user 'oriented' or 'friendly'?
29. How well informed are you kept about upcoming technological changes that might directly affect you or your job?
30. How important is it to you that you be kept informed of upcoming technological changes that might directly affect you or your job?
31. How much input do you have into decisions about technological change that might directly affect your job?
32. How important is it to you that you have some input into decisions about technological change that might directly affect your job?
33. How much control do you have over technological change and its effects on your job?
34. How much control would you like to have over technological change and its effects on your job?
35. To what extent have new technologies and systems contributed to your job satisfaction?
36. To what extent have new technologies and systems contributed to your job dissatisfaction?
37. To what extent have new technologies and systems contributed to improved work performance for you?

38. To what extent is technological change a threat to the security of the *specific job* you do at Co-op Life?
39. To what extent is technological change a threat to your employment security (remaining employed) at Co-op Life?
40. To what extent is technological change accepted as normal at Co-op Life?
41. Generally, how well has Co-op Life implemented new technology and systems?
42. Generally, how threatening is technological change to you?
43. To what extent is Co-op Life management concerned about the impact of technological change on its employees?
44. To what extent is Co-op Life management aware of the impact that technological change might have on its employees?

Add any comments that you might have in the space below:

SECTION C

WORKING CONDITIONS AND QUALITY OF WORKING LIFE

This section is designed to identify how you and your peers at Co-op Life generally perceive your working conditions and quality of working life. Using the scale below, mark the OPSCAN sheet with the answer which *best* describes how you feel about that question.

1	*2*	*3*	*4*	*5*	*6*	*7*
not at all			somewhat			a great deal

45. How satisfied are you with your current job?
46. How positive is employee morale in your immediate unit or department?
47. How positive is employee morale at Co-op Life in general?
48. How much *employment* security do you currently have?
49. How important is employment security to you?
50. How much *job* security do you currently have?
51. How important is job security to you?
52. How much are you respected or 'valued' as an employee?
53. How important is it to you that you be respected or 'valued' as an employee?
54. How much is your work respected or 'valued' by your immediate supervisor or boss?
55. How sufficient is the *quantity* of feedback you receive about your job performance from your supervisor or boss?
56. How sufficient is the *quality* of feedback you receive about your job performance from your supervisor or boss?
57. How much opportunity do you have for contributing input into decisions that directly affect your job?
58. How important is it to you that you have the opportunity to contribute input into decisions that directly affect your job?
59. To what extent are your ideas and input seriously listened to or considered by your supervisor or boss?
60. How much job autonomy (the freedom to do your job the way you see fit) do you have in your current position?
61. How important is job autonomy to you?

62. How challenging is your current job?
63. How important is it to you that your job be challenging?
64. How much opportunity for career advancement do you have at Co-op Life?
65. How important is it to you that you have opportunities for career advancement at your place of work?
66. How much opportunity for personal growth do you have at Co-op Life?
67. How important is it to you that you have opportunities for personal growth at your place of work?
68. To what extent have you been properly trained for the job you are currently doing?
69. How important is it to you that you receive proper training?
70. To what extent does Co-op Life provide career counselling for its employees?
71. How important is it to you that Co-op Life provide career counselling?
72. To what extent does Co-op Life provide training and educational opportunities for its employees?
73. How willing are you to re-train or upgrade your skills?
74. How fair and equitable is the pay you receive?
75. How important is it to you that you receive fair and equitable pay?
76. How fair and equitable is the benefits package you receive?
77. How important is it to you that you receive a fair and equitable benefits package?
78. How positively do you generally view Co-op Life as an employer?
79. How 'open' is communication among employees in general at Co-op Life?
80. How 'friendly' is communication among employees in general at Co-op Life?
81. How 'effective' is communication among employees in general at Co-op Life?
82. To what extent does Co-op Life management provide direction (e.g., informing employees of trends, goals, policy changes, etc.) to its employees?
83. Generally, how co-operative are employees at Co-op Life?

84. To what extent are unit problems and concerns solved as a team?
85. To what extent are employees encouraged to bring their work-related concerns to the attention of other employees, co-workers, or supervisors?
86. To what extent do you feel included in plans for change at Co-op Life?
87. To what extent is the office environment (e.g., lighting and noise levels, seating arrangements, ventilation, etc.) acceptable?
88. To what extent do you believe that information supplied by Co-op Life management to employees is generally open, honest, and truthful?
89. To what extent do "office politics" interfere with normal procedures (e.g., promotions, proper supervisory practices, etc.) at Co-op Life?
90. To what extent does discrimination (racial, sexual, etc.) have an impact on opportunities for advancement at Co-op Life?
91. Generally, how stressed or anxious are you at the end of a day's work?
92. To what extent do you generally look forward to coming into work each day?
93. To what extent is Co-op Life management concerned about the welfare of its employees?

Add any comments that you might have in the space below:

SECTION D

WRITTEN RESPONSES

This section is designed to identify and rank particular issues and concerns that Co-op Life employees might have about technological change and their jobs in general. Please write your responses in the space provided below each question and attempt to make your responses as brief and concise as possible. There is space at the end of this section for additional comments.

94. **What 'things' (if any) do *you* find most satisfying about your job (e.g., pay, benefits, opportunity for advancement, autonomy, the people I work with, etc., etc.)? (Put the most satisfying 'thing' first, the second most satisfying 'thing' second, and so on.)**

    1.

    2.

    3.

    4.

    5.

    6.

    7.

    8.

95. **What 'things' (if any) do *you* find most dissatisfying about your job? (Put the most dissatisfying 'thing' first, the second most dissatisfying 'thing' second, and so on.)**

    1.

    2.

    3.

    4.

    5.

    6.

    7.

    8.

96. In order of importance, what concerns or issues (if any) do *you* consider as *important or critical* regarding technological change? (e.g., job security or job loss, the loss of human contact, health factors such as mental or physical stress, Video Display Terminal radiation emissions, loss of job autonomy, lack of job variety, boredom, etc.)

    1.

    2.

    3.

    4.

    5.

97. In order of importance, what benefits (if any) do you consider as important regarding technological change? (e.g., less menial or repetitive kinds of work, more job flexibility, better efficiency and/or effectiveness, opportunities to learn new skills, etc.)

    1.

    2.

    3.

    4.

    5.

98. In order of importance, what 'things' (if any) could Co-op Life do to improve the process of introducing new technologies and systems? (e.g., improve communication, start 'user' training earlier, ask for more employee or user input, provide retraining for people changing their jobs, make the technology more user friendly, etc.)

    1.

    2.

    3.

    4.

    5.

    6.

    7.

99. In order of importance, what 'things' (if any) do you need from Co-op Life to help you adapt to or prepare for technological change or change in general?

    1.

    2.

    3.

    4.

    5.

100. General comments. Please add any further comments that you might have. If you are referring to a particular question, please note the number of that question beside your response.

THANK YOU FOR YOUR TIME AND INPUT

APPENDIX D: STRUCTURED INTERVIEW SCHEDULE

This study is being conducted to look at the impact of technological change on shifting occupational and skill needs and to determine ways for dealing with employee concerns about technological change. The purpose of this interview in particular, is to obtain information to:

1. Develop a subsequent, company-wide questionnaire regarding technological change and employee concerns
2. Gain an understanding of how the Co-operators generally operates.

Your name and responses will be held strictly confidential. Some of your responses may be used for illustrative purposes, however, the responses will, in no way, be identified with a particular person. Upon completion of the study, all employees will be given access to the general results and interpretations. Also, be very clear that you are under no obligation to take part in this interview if you so choose. Any questions? Let's begin.

SECTION A
DEMOGRAPHICS

1. Name: _____
2. Functional Responsibility: _____
3. Product: _____
4. Job Title: _____
5. Classification (Grade): _____ Cell: _____
6. Years of Service: _____
7. Gender: (Male) ☐ (Female) ☐
8. Age: _____
9. Office Location: (Regina) ☐ (Guelph) ☐
10. Education:

Grade School ☐	Some High School ☐
High School Degree ☐	Some College ☐
College Degree ☐	Some University ☐
Undergraduate Degree ☐	Some Graduate School ☐
Graduate School Degree ☐	

11. Are you, or have you been assigned to a special projects team (i.e., as distinct from your regular job): Yes ☐ No ☐

SECTION B
TECHNOLOGY

12. How would you define or describe technological change? (What does technological change mean to you?)
13. What is your general perception or feeling about technological change? (wait 15 seconds for a reply — if no reply, give descriptors positive, negative, good, bad, needed, a waste of time, fun, scary, too fast, de-humanizing, dangerous, effective.)
14. What personal involvement at Co-operators Life have you had with technological change?
15. How has technology changed, affected, or impacted your job?
16. What new skills have you had to learn as a result of technological change?
17. What changes do you think technology will make in your job within the next few years?

18. What *new* skills do you think you might have to learn in the next few years to keep pace with technological change?
19. Do you see Co-operators Life as having gone through a significant amount of technological change within the past few years?
20. How do you feel you are generally adapting to technological change at Co-op Life (include the 'what')?
21. How would you define "computer literacy"?
22. Are you computer literate?
23. Is computer literacy a job skill requirement for you?
24. Do you think there is a need for all Co-op Life employees to be computer literate?
25. How adequately have you been trained and prepared for the introduction of new technologies and systems?
26. Does Co-op Life provide support and/or training for you to adequately prepare for the future?
27. What could Co-op Life do to improve its support and training of employees for technological change?
28. Are you being kept well informed in advance about new technologies or systems being introduced?
29. Do you feel that the new technology introduced at the Co-operators within the last few years is generally user oriented/friendly?
30. What do you feel could be done to make the technology more user oriented/friendly?
31. As a result of technology, how much control do you think others have over your work behaviour?
32. As a result of technology, how much control do you think you have over the work behaviour of others?
33. Do you see yourself as a 'giver' and/or 'user' of technological change (e.g., trainer, systems designer, data processor, etc.)?
34. What concerns do you have about technological change being implemented in the workplace? (e.g., health, job satisfaction, job loss, constant change, de-humanizing, etc.)
35. Which concerns do you rate as critical or very important (rank from most to least critical)?

36. Describe how well management implements new technology and systems at the Co-operators with regard to past and current practices of:

    a. staff training
    b. keeping staff informed
    c. being asked for your ideas and input?

37. Do you feel that technological change is generally accepted as normal at the Co-operators?

38. How would you describe the 'pace' of technological change being introduced at Co-op Life (e.g., too fast or slow, not enough breathing space between changes, just right, etc.)?

39. Do you think that management is concerned about the impact that new technology might have on employees?

40. Do you think Co-op Life is fully aware of the impact that technological change might have on employees?

41. What do you think are the reasons for the Co-operators implementing technological change?

42. What do you feel is important when new technology or systems are being implemented? (factors/elements e.g., HRD)

43. What would *you* do to improve the process of implementing new technology or systems?

SECTION C
WORKING CONDITIONS

44. How satisfied are you with your current job?
45. What 'things' do you find satisfying about your job?
46. What 'things' do you find dissatisfying about your job?
47. What 'things' do you want from your job in the future?
48. Generally, what changes are in the future for Co-op Life employees?
49. What particular concerns or issues do you have about your job or employment with Co-op Life?
50. Which concerns or issues do you rate as being critical or very important (rank order from most to least important)?
51. What words would you use to describe the Co-operators as an employer?
52. How would you describe the level of co-operation at the Co-operators?
53. In your experience, how do employees generally solve group and departmental concerns (e.g., as a team, individually)?
54. Are employees generally encouraged to bring their work-related concerns to the attention of other employees, co-workers, or supervisors?
55. Do you think that your job is secure in the future?
56. Do you think that you have secure employment with Co-op Life both now and in the future?
57. Are you aware of any employment security policy that Co-op Life may have?
58. What words would you use to describe the type or quality of communication among employees at the Co-operators (e.g., open, closed, effective, ineffective, friendly, strained, good, poor)?
59. What would you like to see Co-op Life do to help you prepare and adapt for the future and change in general?
60. Are employees generally asked for, or do they give, any input into decisions which directly affect them?
61. What impact do you feel employees have into decisions that directly affect them?
62. What words would you use to describe the training you have received at the Co-operators?

63. Do you feel you are respected or 'valued' as an employee?
64. Do you feel that your work is 'valued' by your superiors and management?
65. Do you feel you receive sufficient feedback from your superiors about your job performance in terms of:

    quantity _____

    quality _____
66. How would you describe the morale in your unit or department?
67. How would you describe the morale at Co-op Life in general?
68. What questions do you think should be asked in a company-wide questionnaire that relates to technological change, shifting occupational and skill needs, and employee concerns?

THANK YOU VERY MUCH FOR YOUR TIME AND INPUT

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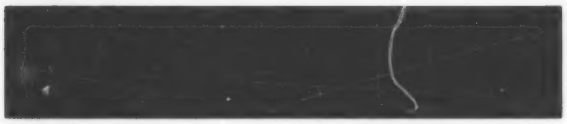
*references from Appendix A are included in this section.

TECHNOLOGICAL CHANGE



What are the effects of technological change on shifts in occupational and skill needs in the workplace? A Saskatchewan-based firm, The Co-operators Life Insurance Company, recently addressed this important question. The company's research, published in this report, is as valid for other Canadian companies as it is for this prairie concern.

Employee attitudes towards technological change were generally positive. Indeed, while technological change reduced the need for production and clerical workers, business growth, created in the main by the same technology, mitigated direct job loss.

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